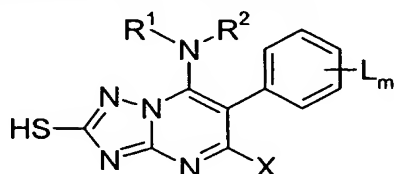


We claim:

1. A 2-mercapto-substituted triazolopyrimidine of the formula I



5 in which the substituents are as defined below:

L independently of one another are halogen, cyano, nitro, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>2</sub>-C<sub>10</sub>-alkenyl, C<sub>2</sub>-C<sub>10</sub>-alkynyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl, C<sub>2</sub>-C<sub>10</sub>-haloalkenyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, C<sub>2</sub>-C<sub>10</sub>-alkenyloxy, C<sub>2</sub>-C<sub>10</sub>-alkynyloxy, C<sub>1</sub>-C<sub>6</sub>-haloalkoxy or -C(=O)-A;

10

A is hydrogen, hydroxyl, C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>2</sub>-C<sub>8</sub>-alkenyl, C<sub>1</sub>-C<sub>8</sub>-alkoxy, C<sub>1</sub>-C<sub>6</sub>-haloalkoxy, C<sub>1</sub>-C<sub>8</sub>-alkylamino or di-(C<sub>1</sub>-C<sub>8</sub>-alkyl)amino;

m is 0, 1, 2, 3, 4 or 5;

15

X is halogen, cyano, C<sub>1</sub>-C<sub>4</sub>-alkyl, C<sub>1</sub>-C<sub>4</sub>-haloalkyl, C<sub>1</sub>-C<sub>4</sub>-alkoxy or C<sub>1</sub>-C<sub>2</sub>-haloalkoxy;

20

R<sup>1</sup>, R<sup>2</sup> independently of one another are hydrogen, C<sub>1</sub>-C<sub>8</sub>-alkyl, C<sub>1</sub>-C<sub>8</sub>-haloalkyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>3</sub>-C<sub>6</sub>-halocycloalkyl, C<sub>2</sub>-C<sub>8</sub>-alkenyl, C<sub>4</sub>-C<sub>10</sub>-alkadienyl, C<sub>2</sub>-C<sub>8</sub>-haloalkenyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkenyl, C<sub>2</sub>-C<sub>8</sub>-alkynyl, C<sub>2</sub>-C<sub>8</sub>-haloalkynyl or C<sub>3</sub>-C<sub>6</sub>-cycloalkynyl, phenyl, naphthyl or a five- to ten-membered saturated, partially unsaturated or aromatic heterocycle which contains one to four hetero atoms from the group consisting of O, N and S,

25

R<sup>1</sup> and R<sup>2</sup> together with the nitrogen atom to which they are attached may also form a five- or six-membered ring which may be interrupted by one atom from the group consisting of O, N and S and/or may carry one or more substituents from the group consisting of halogen, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl and oxy-C<sub>1</sub>-C<sub>3</sub>-alkyleneoxy or in which a nitrogen atom and an adjacent carbon atom may be linked by a C<sub>1</sub>-C<sub>4</sub>-alkylene chain;

30

where R<sup>1</sup> and/or R<sup>2</sup> may be substituted by one to four identical or different groups R<sup>a</sup>:

35

R<sup>a</sup> is halogen, cyano, nitro, hydroxyl, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>6</sub>-haloalkyl, C<sub>1</sub>-C<sub>6</sub>-alkylcarbonyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>1</sub>-C<sub>6</sub>-alkoxy, C<sub>1</sub>-C<sub>6</sub>-haloalkoxy, C<sub>1</sub>-C<sub>6</sub>-

5 alkoxy carbonyl, C<sub>1</sub>-C<sub>6</sub>-alkylthio, C<sub>1</sub>-C<sub>6</sub>-alkylamino, di-C<sub>1</sub>-C<sub>6</sub>-alkylamino, C<sub>2</sub>-C<sub>6</sub>-alkenyl, C<sub>2</sub>-C<sub>6</sub>-alkenyloxy, C<sub>3</sub>-C<sub>6</sub>-alkynyloxy, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, phenyl, naphthyl, a five- to ten-membered saturated, partially unsaturated or aromatic heterocycle which contains one to four hetero atoms from the group consisting of O, N and S,

where these aliphatic, alicyclic or aromatic groups for their part may be partially or fully halogenated or may carry one to three groups R<sup>b</sup>:

10 R<sup>b</sup> is halogen, cyano, nitro, hydroxyl, mercapto, amino, carboxyl, amino-carbonyl, aminothiocarbonyl, alkyl, haloalkyl, alkenyl, alkenyloxy, alkynyloxy, alkoxy, haloalkoxy, alkylthio, alkylamino, dialkylamino, formyl, alkylcarbonyl, alkylsulfonyl, alkylsulfoxyl, alkoxy carbonyl, alkyl-carbonyloxy, alkylaminocarbonyl, dialkylaminocarbonyl, alkylaminothiocarbonyl, dialkylaminothiocarbonyl, where the alkyl groups in these radicals contain 1 to 6 carbon atoms and the alkenyl or alkynyl groups in these radicals contain 2 to 8 carbon atoms;

and/or one to three of the following radicals:

20 cycloalkyl, cycloalkoxy, heterocyclyl, heterocyclyloxy, where the cyclic systems contain 3 to 10 ring members; aryl, aryloxy, arylthio, aryl-C<sub>1</sub>-C<sub>6</sub>-alkoxy, aryl-C<sub>1</sub>-C<sub>6</sub>-alkyl, hetaryl, hetaryloxy, hetarylthio, where the alkyl radicals preferably contain 6 to 10 ring members and the hetaryl radicals 5 or 6 ring members, where the cyclic systems may be partially or fully halogenated or substituted by alkyl or haloalkyl groups,

or a salt thereof.

30 2. A compound of the formula I as claimed in claim 1 in which X is halogen.

3. A compound of the formula I as claimed in claim 1 or 2 in which R<sup>1</sup> and R<sup>2</sup> are as defined below:

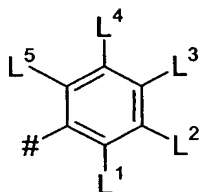
35 R<sup>1</sup> is C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>1</sub>-C<sub>8</sub>-haloalkyl, C<sub>3</sub>-C<sub>6</sub>-cycloalkyl, C<sub>3</sub>-C<sub>6</sub>-halocycloalkyl, C<sub>2</sub>-C<sub>8</sub>-alkenyl, C<sub>2</sub>-C<sub>8</sub>-haloalkenyl, C<sub>2</sub>-C<sub>8</sub>-alkynyl; and

R<sup>2</sup> is hydrogen or C<sub>1</sub>-C<sub>4</sub>-alkyl; or

$R^1$  and  $R^2$  together with the nitrogen atom to which they are attached may also form a five- or six-membered saturated or unsaturated ring which may carry one or two substituents from the group consisting of halogen,  $C_1$ - $C_6$ -alkyl and  $C_1$ - $C_6$ -haloalkyl.

5

4. A compound of the formula I as claimed in any of claims 1 to 3 in which the phenyl group substituted by  $L_m$  is the group A



A

in which # is the point of attachment to the triazolopyrimidine skeleton and

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$L^1$  is fluorine, chlorine,  $CH_3$  or  $CF_3$ ;

$L^2, L^4$  independently of one another are hydrogen or fluorine;

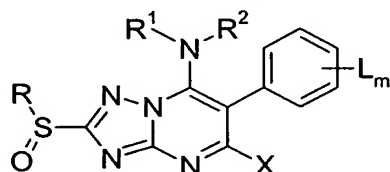
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$L^3$  is hydrogen, fluorine, chlorine, cyano,  $CH_3$  or  $COOCH_3$ ; and

$L^5$  is hydrogen, fluorine or  $CH_3$ .

20

5. A process for preparing the compounds of the formula I as claimed in claim 1 by reacting sulfoxides of the formula II

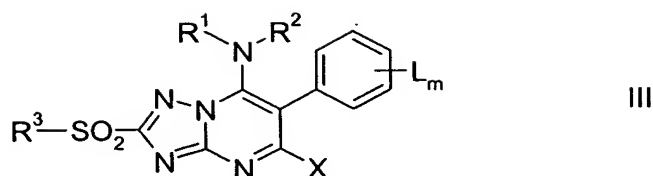


II

in which the variables are as defined for formula I and R is a  $C_1$ - $C_4$ -alkyl group or a benzyl group which is unsubstituted or substituted by one or more groups  $R^6$  with trifluoroacetic anhydride.

25

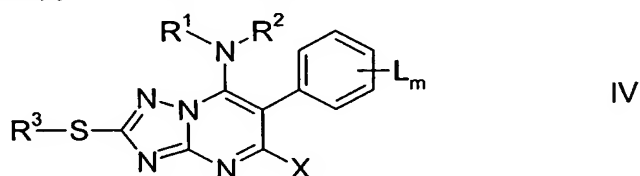
6. A process for preparing the compounds of the formula I as claimed in claim 1 by reacting sulfones of the formula III



in which the variables are as defined in formula I  
with alkali metal thiolates or with sulfides  $M_2S$ , where M is a cation from the group  
of the alkali metals or an ammonium group.

5

7. A process for preparing the compounds of formula I as claimed in claim 1 by reacting triazolopyrimidines of the formula IV



10

in which  $R^3$  is a benzyl group which is unsubstituted or substituted by one or more groups  $R^b$   
with Lewis acids or under basic conditions in an inert solvent or diluent.

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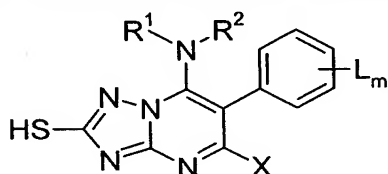
8. A process for preparing the compounds of the formula I as claimed in claim 1 by reacting triazolopyrimidines of the formula IV as set forth in claim 7 with sodium in liquid ammonia.
9. A composition suitable for controlling harmful fungi which composition comprises a solid or liquid carrier and a compound of the formula I as claimed in claim 1.
10. A method for controlling phytopathogenic harmful fungi which comprises treating the fungi or the materials, plants, the soil or seeds to be protected against fungal attack with an effective amount of a compound of the formula I as claimed in claim 1.

2-Mercapto-substituted triazolopyrimidines, their preparation and their use for controlling harmful fungi, and compositions comprising these compounds

# Abstract

5

2-Mercapto-substituted triazolopyrimidines of the formula I



in which the substituents are as defined below:

- 10 L is halogen, cyano, nitro, alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, alkoxy, alkenyloxy, alkynyloxy, haloalkoxy or -C(=O)-A;
- A is hydrogen, hydroxyl, alkyl, alkenyl, alkoxy, haloalkoxy, alkylamino or dialkylamino;
- 15 m is 0, 1, 2, 3, 4 or 5;
- X is halogen, cyano, alkyl, haloalkyl, alkoxy or haloalkoxy;
- 20 R<sup>1</sup>, R<sup>2</sup> are hydrogen, alkyl, haloalkyl, cycloalkyl, halocycloalkyl, alkenyl, alkadienyl, haloalkenyl, cycloalkenyl, alkynyl, haloalkynyl or cycloalkynyl, phenyl, naphthyl or a five- to ten-membered saturated, partially unsaturated or aromatic heterocycle which contains one to four hetero atoms from the group consisting of O, N and S; R<sup>1</sup> and R<sup>2</sup> together with the nitrogen atom to which they are attached may also
- 25 form a five- or six-membered ring which may be interrupted by an atom from the group consisting of O, N and S;
- where R<sup>1</sup> and/or R<sup>2</sup> may be substituted as stated in the description;
- 30 processes for preparing these compounds, compositions comprising them and their use for controlling phytopathogenic harmful fungi are described.